

KNO-004 · From Symbols to Writing

KNO · Ways of Knowing

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Article Abstract

Ask when writing began and the answer depends entirely on what is being counted. Notched bone, potters' marks, accounting tokens, knotted cords and this sentence have all been called writing. KNO-004 separates six things that the single word collapses: mark, symbol, notation, proto-writing, partial writing and full writing. It treats them as analytic categories rather than rungs of a ladder, because the record shows societies crossing them in different orders, stopping at different points, and building powerful recording systems that never became writing and never tried to. The threshold it uses is glottography, the encoding of a specific utterance in a specific language such that a reader recovers wording rather than gist. It examines four traditions usually called independent inventions, one case still genuinely disputed, and the inventions documented in historical time, and closes with what the evidence cannot settle.

In 60 Seconds

A mark can be deliberate without being a symbol, and a symbol system can be powerful without encoding language. What converts a symbol system into writing, under the definition used here, is phonetic transfer: the discovery that a sign can stand for the sound of its name rather than for its meaning. Before that step a system grows only by adding signs; after it, the inventory stabilises and then contracts while the range of expressible content stops having a limit. Southwest Asia preserves the only stratified sequence in which tokens, sealed envelopes, impressed numerical tablets and proto-cuneiform can all be examined together, although that order records first attestation and not descent. The Indus corpus shows why the threshold matters: the dispute there is not about age or sophistication but about whether the signs encode language at all, and it remains open. Numerical, mathematical and musical notations show that a closed system can be unlimited within its domain and encode no language, not because it fell short but because it was never trying. The Cherokee and Vai syllabaries show that once the idea of writing is available, a working system can be built in a few years.

Why This Question Matters

Writing is routinely treated as the boundary between prehistory and history, so what counts as writing decides which societies are said to have entered the record at all. Reading every repeated mark as script inflates the story past its objects; admitting only deciphered scripts erases the recording systems that carried accounts and quantities without encoding language. The distinction also carries a general lesson about evidence: what a system could do, what it was for, and where it came from are three separate claims, and establishing one of them does not establish the others.

1. The problem with the word "writing"

Ask when writing began and the answer depends entirely on what is being counted. Marks on bone from the Upper Palaeolithic, tallies, potters' marks, seal impressions, accounting tokens, Andean knotted cords, mathematical notation and this sentence have all been called writing by someone. They are not the same kind of thing, and the differences are not matters of degree.

The confusion is old and it has a cause. The word carries two distinct ideas at once. One is the general idea of durable graphic communication, of making a mark that carries meaning to someone absent in space or time. The other is the specific idea of encoding language, of a system that captures a particular utterance so completely that a competent reader can reproduce it. Almost every dispute about the origins of writing turns out, on inspection, to be a dispute about which of these two is meant.

This article uses the second sense for the word writing and gives the first sense its own vocabulary. That is a stipulation, not a discovery, and it is worth stating plainly rather than smuggling in.

Where That Leaves Us

Almost every dispute about the origins of writing is a dispute about which of two ideas the word carries: durable graphic communication, or the encoding of a particular utterance. This article uses the second and gives the first its own vocabulary. That is a stipulation and not a discovery, which is why it is stated plainly, and it is what makes the distinctions that follow necessary rather than tidy.

2. Six categories, not six stages

The following distinctions are analytic. They classify what a system does, not when it appeared or what it turned into.

Mark. A deliberate graphic trace whose meaning, if any, is not recoverable from the trace itself. A notch, a stroke, a scratch. Marks may be counters, ownership signs, decoration, or nothing at all. The interpretive problem is that a mark and a sign look identical when the context is lost.

Symbol. A graphic form conventionally associated with a referent, where the association is shared across a community rather than private. A symbol carries meaning without carrying language. A crossed circle can mean a place, a god, a clan or a commodity, and its users can read it whatever language they speak, **so long as they share the convention**. What crosses a language boundary is the convention and not the sign, and a sign whose convention is not shared carries nothing.

Notation. A closed system of symbols with rules of combination, restricted to one domain. Numerical notation is the clearest case: a small inventory, strict syntax, unlimited productivity within its domain, and no capacity to say anything outside it. Notation is not defective writing. It is a different instrument, and it can outperform writing at what it does. The comparative history of numerical systems shows notation developing along its own constrained pathways, in societies with and without writing (Chrisomalis 2010).

Proto-writing. A symbol system with enough conventional signs, enough regularity and enough combinatorial behaviour to record structured content, but without a demonstrable link to the sounds or grammar of a specific language. Proto-writing can record what was owed, to whom and how much. It cannot record why, or what someone said about it.

Partial writing. A system that does encode language, but only within a bounded domain and only for a restricted range of utterances. Early administrative scripts are the type case: they encode names, quantities and commodity terms in a real language, with real phonetic signs, and nothing else. A reader recovers the wording of a receipt and could not use the same system to record a complaint.

Full writing. A system capable of encoding any utterance in its language, including utterances the system was not designed for. This is the property that matters and it is the one that makes decipherment possible in principle, because an open system leaves grammatical traces: function words, affixes, agreement, sign frequencies that behave like a language rather than like a list.

The reason for insisting on six categories rather than a line is that the record does not run along the line. Numerical notation and full writing coexist and always have. Proto-writing sometimes precedes writing in the same tradition and sometimes has no descendants. Partial writing sometimes expands into full writing over centuries and sometimes does not expand at all. And the categories are properties of systems in use, so the same signs can belong to different categories in different hands.

Where That Leaves Us

Mark, symbol, notation, proto-writing, partial writing and full writing classify what a system does, not when it appeared or what it later became. A symbol carries meaning without carrying language, and what crosses a language boundary is the convention rather than the sign. Notation is not defective writing but a different instrument, and reading any of these as a rung converts a classification into a history it cannot support.

3. The threshold: phonetic transfer

What converts a symbol system into a writing system is the discovery that a sign can stand for the sound of its name rather than for its meaning. Once a sign for a reed can be used to write any syllable that sounds like the word for reed, the inventory stops being a list of things and becomes a way of spelling. This is usually called the rebus principle, and it is the mechanism visible in the independently attested transitions this article examines. **Whether every such transition anywhere took that route is not established here**, and the cases below are read as cases rather than as instances of a rule.

Its importance is structural rather than clever. Before phonetic transfer, the system can only grow by adding signs, and it can only express what it has signs for. After phonetic transfer, the system can express anything sayable, including proper names, foreign words, abstractions and grammatical endings, with an inventory that stops growing and begins to shrink. The signature of the crossing is therefore not a new sign but a new economy: sign inventories that stabilise, then contract, while the range of expressible content expands without limit.

This gives a workable indicator, and an indicator is not a test. A system whose sign count keeps rising with the range of content is unlikely to be glottographic. A system whose sign count falls while its content broadens is behaving as a glottographic system does, **which is evidence and not a demonstration**: classifying a system needs converging evidence, from sign frequencies, from grammatical traces and from the range of content actually recorded, and the sign count alone settles nothing.

Where That Leaves Us

Phonetic transfer is the mechanism this article follows: a sign able to stand for the sound of its name stops being an entry in a list and becomes a way of spelling. Its signature is an economy rather than a shape, with inventories that stabilise and then contract while expressible content stops having a limit. That yields a workable indicator and not a test, so classification still needs converging evidence.

4. Four traditions usually treated as independent

Four traditions are conventionally described as inventing writing without a model. The word usually is doing real work in that sentence, and section 7 returns to it.

4.1 Southwest Asia

Mesopotamia offers the only case where something close to the whole sequence is visible in stratified material. The fourth millennium yields clay tokens, sealed clay envelopes, impressed numerical tablets and, in the late fourth millennium, proto-cuneiform tablets from Uruk, followed over several centuries by cuneiform capable of recording Sumerian and later Akkadian in full. **The order in that list is the order of first attestation and not a line of descent.** The media overlap in use, several of them are in circulation at once, and which of them is ancestral to which is disputed rather than settled.

The influential proposal that the clay tokens are the direct ancestors of the signs, with three dimensional counters flattening into two dimensional impressions and then into drawn characters, was set out at length by Schmandt Besserat (1992). It has never commanded consensus. Reviewers questioned both the geographic argument and the proliferation of token shapes on which the sign correspondences depend (Van De Mieroop 1994). The honest summary is that tokens and early tablets belong to one accounting world and that a specific genealogy from token shape to sign shape remains contested rather than established.

Recent work has widened the pool of possible ancestors beyond tokens. A study of late pre literate cylinder seal imagery identifies motifs, including a fringed cloth and a netted vessel, that recur as proto cuneiform signs used for the same commodities, arguing that seal iconography and emerging script were parts of one clay based communication practice rather than a source and a derivative (Kelley, Cartolano and Ferrara 2025). This does not resolve the token question. It reframes it, by removing the assumption that the ancestry has to be single.

Two features of proto cuneiform deserve emphasis because they are what the six categories are for. Its known texts are administrative, they show no syntax, and no reading of them as sentences in a language has been established. By the definitions above it falls on the proto writing side, or at most the partial writing side, **and that placement is a reading of the surviving corpus rather than a property demonstrated of the system.** Several further centuries separate it from cuneiform recording Sumerian in full.

4.2 Egypt

The tomb labelled U j at Abydos yielded roughly 160 small incised bone and ivory labels which the excavator identified as the earliest Egyptian writing, from the late fourth millennium (Dreyer 1998). Radiocarbon work on the Umm el Qaab necropolis provides the chronological frame for the sequence of royal tombs there (Görsdorf, Dreyer and Hartung 1998), and the imported jars from the tomb have been reassessed petrographically and contextually more recently (Ownby, Hartung and Sowada 2022).

The Egyptian case is important for a reason that has nothing to do with priority. The earliest labels already use phonetic signs. No long apprenticeship is visible in the surviving material, and no stage of purely semantic Egyptian symbols slowly acquiring sound values is attested. That stage may have happened on materials that do not survive; it may not have happened; or it may have happened on surviving materials that have not been recognised as such. **The alternatives are not exhausted by the first two**, and none of them makes the independence of the Egyptian invention a settled fact either way.

4.3 China

The oracle bone inscriptions of the late Shang capital at Anyang are already a mature writing system when they appear. They encode a real language, with grammatical particles and productive phonetic elements, and they can be read. Radiocarbon dating of oracle bones places the reign of Wu Ding, from which the earliest large corpus comes, at roughly the thirteenth century BCE, with the Shang ending around the mid eleventh (Liu et al. 2021).

The problem is the gap behind them. Neolithic incised signs are known from much earlier sites, including tortoise shell and bone marks from Jiahu in the seventh millennium BCE, which were published under a question mark rather than a claim (Li et al. 2003). Nothing demonstrates continuity between those marks and Shang writing, and several thousand years separate them. The Chinese case is therefore the clearest illustration of a general problem: a mature script with no visible ancestry tells us that the ancestry was written on something that rots.

4.4 Mesoamerica

Mesoamerica supplies the strongest case for genuinely independent invention among those discussed here, because no plausible contact route to Old World scripts has been proposed. **That is an argument from the absence of a proposed route**, which is the form section 8 warns is the weakest available, and it is offered as such. It also supplies the most instructive dispute about evidence.

The Cascajal Block, a serpentine slab bearing sixty two signs, was published as the oldest writing in the New World and assigned to the San Lorenzo phase ending around 900 BCE (Rodríguez Martínez et al. 2006). The block was not excavated. Road builders recovered it from a debris pile in the late 1990s, and the publication states plainly that it is divorced from its stratigraphic context and dated by association with surrounding material and by iconographic analysis. Whatever the block is, its date rests on inference from an unstratified find, and that should be said whenever it is cited.

Zapotec carved stones from the Valley of Oaxaca provide a better anchored early case, with Monument 3 at San José Mogote bearing a calendrical day name beside a captive figure (Marcus 1976). Maya writing is fully glottographic and decipherable, and a day sign recovered from sealed contexts at San Bartolo pushes attested Maya calendrical writing back to roughly the third to second century BCE (Stuart et al. 2022), following the earlier publication of hieroglyphic text from the same site (Saturno, Stuart and Beltrán 2006).

Where That Leaves Us

The four traditions are conventionally called independent inventions, and the word conventionally carries the weight. Mesopotamia's sequence is an order of first attestation rather than a line of descent, the token-to-sign genealogy has never commanded consensus, and the Cascajal Block is dated by association from an unstratified find. Mesoamerican independence rests on no contact route having been proposed, which is the weakest form available.

5. The case that shows why the threshold matters

The Indus Valley signs are the best available test of the framework, precisely because their status is unresolved.

One position holds that the corpus is not writing at all. The inscriptions are extremely short, averaging under five signs with the longest known at seventeen; a quarter of the sign inventory occurs only once; the sign repetition patterns do not behave as phonetic scripts do; and the archaeological correlates of manuscript production are absent. On this reading the signs are a non linguistic emblem system comparable to Near Eastern seal and badge conventions (Farmer, Sproat and Witzel 2004).

The opposing position applies statistical measures of sequence structure. Conditional entropy computed over the Indus corpus falls closer to that of known languages than to that of non linguistic sign systems, which the authors offer as evidence, explicitly not proof, that the signs encode language (Rao et al. 2009). The method was then contested on its own ground, with a wider battery of statistical tests reported as failing to separate linguistic from non linguistic systems reliably (Sproat 2014).

Two things follow. First, the dispute is not about how old the Indus signs are or how sophisticated the society was. It is about whether a symbol system crossed the glottographic threshold, which is exactly the distinction section 2 sets out. Second, statistical structure alone has so far not settled it. Short texts carry little signal, and the argument from sequence statistics has proved reversible.

Where That Leaves Us

The Indus corpus is the best available test of the framework precisely because its status is unresolved. Short inscriptions, a large one-off sign inventory and absent manuscript correlates support a non-linguistic reading; conditional entropy places the corpus nearer known languages; a wider battery of tests was then reported as failing to separate the two classes reliably. The dispute is about glottography, not about age or sophistication.

6. Systems that were never trying to become writing

Treating writing as the destination makes every other recording system look like an attempt that fell short. This is a serious historiographic error and it distorts what those systems were for.

Numerical notation is the plainest counterexample. It is closed, precise, unlimited within its domain and completely unable to encode language, and it has never been under pressure to change (Chrisomalis 2010). Mathematical, chemical and musical notations behave the same way. They are semasiographic by design: they represent content directly rather than through language, which is why they cross language boundaries without translation.

Mesoamerican and Andean recording systems have been analysed on the same terms, as literacies in their own right rather than as approximations to alphabetic writing (Boone and Mignolo 1994). The Inka khipu, a system of knotted cords, is the hardest case in that group. Its accounting function is not in doubt; the proposal that it also encodes non numerical content through a binary combinatorial coding is a live hypothesis rather than a demonstrated fact (Urton 2003).

The general point is that semasiography is not a stage. It is a permanent alternative, it coexists with writing everywhere writing exists, and in several domains it is the better tool.

Where That Leaves Us

Numerical, mathematical, chemical and musical notations are closed, precise, unlimited within their domains and unable to encode language, and they have never been under pressure to change. Mesoamerican and Andean systems have been analysed as literacies in their own right rather than as approximations. The khipu's accounting function is not in doubt while its proposed non-numerical coding remains a hypothesis. Semasiography is a permanent alternative, not a stage.

7. How fast the step can be: the documented inventions

The strongest evidence against a slow universal ladder comes from cases observed in historical time.

The Cherokee syllabary was devised by Sequoyah and was in use by the early 1820s, receiving Cherokee council recognition in 1821 (Cushman 2011). It is a complete syllabary for a real language, produced without a long developmental sequence, by someone who knew that writing existed among neighbours. Archaeological work has been brought to bear on the question of its independence (Weeks and Tankersley 2011).

The Vai syllabary of Liberia followed within about a decade, and the question of whether it was influenced by Cherokee through Liberian settlers has been examined in detail rather than assumed either way (Tuchscherer and Hair 2002).

These cases isolate the variable that the archaeological cases cannot. What takes centuries is not the invention of writing. It is the invention of the idea that language can be written at all. In the two cases documented in historical time, once that idea was available, even at second hand and without knowledge of any particular script, a functioning system was built within a few years.

Two cases are what this supports, and they show that the step can be fast rather than that it always is. This is stimulus diffusion, and it means that independence claims for the ancient cases require an argument about what their inventors could have known, not merely a demonstration that their signs look unlike anyone else's.

Where That Leaves Us

The Cherokee syllabary was in use by the early 1820s and received council recognition in 1821, and the Vai syllabary followed within about a decade, its possible Cherokee influence examined rather than assumed. These cases isolate what the archaeological ones cannot: the slow part is not building a script but the arrival of the idea that language can be written. Two cases support that the step can be fast.

8. What the evidence cannot settle

Four limits deserve to be stated rather than managed.

Preservation. Early writing survives on clay, stone, bone and shell. It was also written on papyrus, bark, bamboo, wood, cloth and skin, which do not survive in most climates. An apparently sudden appearance of a mature script is compatible with a long invisible development, and further excavation in a medium that does not preserve cannot rule that out. **Compatible is not the same as likely**, and the bias runs in one direction only: it can hide a development that happened and cannot manufacture one that did not.

Negative claims about independence. Showing that two scripts differ does not show that one was invented without knowledge of the other, because stimulus diffusion transmits the idea and not the forms. Independence is therefore an argument from opportunity and contact, and those arguments get weaker as evidence of long distance contact accumulates.

Undeciphered corpora. For a script with no bilingual, no known descendant language and short texts, the question of whether it is writing may not be answerable with present methods. That is a statement about method, not a verdict on the society.

The categories themselves. The six terms in section 2 are instruments, not natural kinds. A different partition would produce different boundary cases. What the partition should not do is convert into a chronology, and the main claim of this article is that the standard chronological reading of those terms is the error to avoid.

Where That Leaves Us

Four limits are stated rather than managed. Preservation can hide a development that happened and cannot manufacture one that did not. Showing that two scripts differ does not show independent invention, because stimulus diffusion transmits the idea and not the forms. An undeciphered corpus may be unanswerable by present methods, which is a statement about method. And the six terms are instruments rather than natural kinds.

9. Conclusion

Writing did not emerge once, and it did not emerge by a single route. Symbol systems became writing when signs began to carry sound as well as sense, and that step was taken at different times, for different reasons, in traditions that reached it from different starting points. Some traditions took it early and expanded slowly. One appears to have taken it immediately. Others built recording systems of great power and never took it, because their purposes did not require it.

The useful question is not when writing began. It is what a given system could do, for whom, and what it could not do. Answering that requires the distinctions, and it forbids the ladder.

Where That Leaves Us

Writing did not emerge once or by a single route. Signs began to carry sound as well as sense at different times and for different reasons, in traditions reaching it from different starting places, while others built powerful recording systems and never took the step, because their purposes did not require it. The useful question is what a given system could do, for whom, and what it could not.

What We Know, and How

Stratified fourth-millennium material from southwest Asia preserves the only sequence in which tokens, sealed envelopes, impressed numerical tablets and proto-cuneiform can be examined together, though that order is one of first attestation rather than descent. Documented modern inventions establish the pace: the Cherokee syllabary was in use by the early 1820s and received council recognition in 1821, and the Vai syllabary followed within about a decade. Numerical, mathematical, chemical and musical notations show that a closed system can be unlimited within its domain and still encode no language at all.

What We Still Don't Know

Whether the Indus signs encode language is unresolved: entropy measures placed them nearer known languages, that method was contested on its own ground, and no bilingual exists. Whether clay tokens are the direct ancestors of cuneiform signs has never commanded consensus. Whether every transition to writing took the phonetic-transfer route is not established here. Whether the Inka khipu encodes non-numerical content remains a live hypothesis rather than a demonstrated fact.

What Could Change Our Minds

A bilingual, a known descendant language or substantially longer texts would move the Indus question from method to evidence. Excavation in a medium that preserves could reveal a long development behind an apparently sudden script, although that bias runs in one direction only and can hide a development that happened rather than manufacture one that did not. Accumulating evidence of long-distance contact would weaken the independence claims, which rest on opportunity and not on demonstration.

If You Remember Only One Thing

Writing begins when a sign can carry the sound of its name rather than its meaning; every other recording system is an alternative rather than a failed attempt.

Related Articles

- KNO-002 · *Counting Before Numbers*
- KNO-003 · *From Marks to Symbols*
- KNO-005 · *Oral Language and Transmission*

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